



*KNOWLEDGE ENHANCEMENT EVENTS:
DAMAGE ASSESSMENT BUILDING ABANDONMENT
AFTER ACTION REPORT*

FEMA REGION VIII NATIONAL PREPAREDNESS DIVISION

LAKEWOOD, CO

APRIL 17, 2012

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14. ABSTRACT Rapid and accurate assessment of property damage is essential after disaster events, especially in densely built-up urban areas. The results of damage assessment provide guidance for rehabilitation and reconstruction in the recovery phase. The purpose of this Working Group was to bring together a diverse group of stakeholders to develop and document best practices for conducting damage assessments, as well as identify components of an effective damage assessment process based on lessons learned from past events					
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1.0 Executive Summary

This After Action Report (AAR) was developed following the Damage Assessment Building Abandonment Knowledge Enhancement Working Group (KEWG), which occurred on April 17, 2012 at the FEMA Region VIII National Preparedness Division, in Lakewood, Colorado. This AAR incorporates information from recorder notes, including questions, comments, recommendations, and includes information from the feedback forms.

Rapid and accurate assessment of property damage is essential after disaster events, especially in densely built-up urban areas. The results of damage assessment provide guidance for rehabilitation and reconstruction in the recovery phase. The purpose of the Damage Assessment Building Abandonment Knowledge Enhancement Working Group was to bring together a diverse group of stakeholders to develop and document best practices for conducting damage assessments, as well as identify components of an effective damage assessment process based on lessons learned from past events. There were approximately twenty-five people in attendance representing local, regional, state and federal emergency management officials, building officials, CDPHE, FEMA Individual Assistance (IA) and Public Assistance (PA) programs, and private sector officials.

Matthew Donley, Senior Project Manager at Belfor Property Restoration, presented to the group regarding his experiences in post-disaster damage assessment. Belfor Property Restoration is the largest property restoration company in the world with 195 offices in 27 countries. Belfor Property Restoration provides services to restore and repair damage to commercial and residential properties following disasters. Mr. Donley discussed the complexities of damage assessment and solutions that Belfor Property Restoration has employed in the past to deal with the unique challenges of damage assessment and property restoration.

This Working Group also included presentations by Scott Chamberlain (FEMA Region VIII, IA), Mark Randle (SBA Office of Disaster Assistance), and John Miller (American Red Cross) regarding the most current tools and technologies being used for damage assessment. All three organizations are moving away from a pencil-and-paper approach towards employing technology to collect real-time data in the damage assessment process that can be easily transmitted within and between agencies.

The KEWG participants divided up into breakout groups to discuss some of the fundamental questions related to the damage assessment process, as well as specific challenges in the short-term, intermediate, and long-term phases of recovery following a radiological incident. The WARRP Framework Writing team will incorporate findings from this report into the Denver UASI and State of Colorado All-Hazards Regional Recovery Framework with CBR Annexes as part of the Wide Area Recovery and Resiliency Program (WARRP).

The content of this After Action Report represents the best efforts of the participants based on the information available at the time of publication, but is not intended to convey formal guidance or policy of the federal government or other participating agencies. The views and opinions expressed herein do not necessarily state or reflect those of their respective organizations or the US Government.

2.0 Background

The Departments of Defense and Homeland Security, in close coordination with the Denver Urban Area Security Initiative (UASI), have partnered to establish the Wide Area Recovery and Resiliency Program (WARRP). The purpose of this collaborative program is to study, develop and demonstrate frameworks, operational capabilities and interagency coordination, enabling a timely return to functionality and re-establishment of socio-economic order and basic services through execution of recovery and resiliency activities, as applicable. This program will explore a coordinated systems approach to the recovery and resiliency of wide urban areas, including meeting public health requirements and restoring all types of critical infrastructure, key resources (both civilian and military) and high traffic areas (transit/transportation facilities) following a chemical, biological or radiological (CBR) incident.

3.0 Goal & Objectives

Goal

The goal of the KEWG was to advance the planning of federal, state and local officials in the area of damage assessment following a CBR wide-area event in the Denver, CO urban area.

Objectives

- Develop a common understanding for how damage assessment would be conducted after a wide area catastrophic event.
- Identify components of an effective damage assessment process based upon lessons learned from past catastrophic and wide area events.
- Collaboration between a diversity of stakeholders to develop best practices for damage assessment in the Denver urban area following a wide area event.

4.0 Scope & Format

Scope

In the aftermath of a destructive event, the transition from emergency response to short and long-term recovery is dependent on the ability of a community or region to assess damage done and identify resources needed to return the area to normal operations. The goal of damage assessment is to establish a process for collecting, analyzing, and addressing these needs. The damage assessment system needs to be flexible and scalable enough to apply to minor incidents as well as catastrophic disasters, like a CBR event. The goal of the Damage Assessment KEWG was to identify best practices, participants, and tools to be used throughout the damages assessment process.

Format

This workshop was a one day interactive event. See [Annex A –Agenda](#). The event was held at the FEMA Region VIII National Preparedness Division, in Lakewood, Colorado on April 17, 2012. Participants from various organizations attended and are listed in [Annex B – Participants](#). Feedback was captured using a standard feedback form and a summary of workshop findings are found in [Annex C – Participant Feedback](#). For information on the planning team, or to get more information on this after action report, see [Annex D – Key Points of Contact](#).

The event used the WARRP Radiological Device scenario to base workshop content. For a summary of the three WARRP scenarios see [Annex E – Scenarios](#).

Mapping Technology examples are included in [Annex F – Japan Damage Assessment Mapping](#).

5.0 Key Discussion Areas & Outcomes

The Damage Assessment Building Abandonment KEWG included presentations by Scott Chamberlain (FEMA Region VIII, IA), Mark Randle (SBA Office of Disaster Assistance), and John Miller (American Red Cross) regarding the most current tools and technologies being used for damage assessment. A summary of the key points of each presentation is below:

Scott Chamberlain- FEMA Region VIII

In his presentation, Scott Chamberlain outlined FEMA's new data collection tool for damage assessment. FEMA has purchased Android based application, Motorola tablets and have updated their process for completing damage assessment with this new technology. The new system allows for additional information to be included in the damage assessment analysis, including type of survey, actual water level, water contamination, owner vs. renter, power outages, road and bridge damage, agricultural impact, shelter availability and VOAD activities.

There are several advantages to the new system. FEMA will be able to obtain the dollar amount of damage for the community much sooner, which will speed of the declaration process and the disbursement of assistance. In addition, the tablets allow quicker access to real time data. If there is no signal, at the time of collection, the tablets will store the information until there is a signal and the data can be uploaded. The information that is collected by the tablets will be quickly and easily accessible by anyone with access.

The use of the tablet system is a pilot program this summer. If the program is successful, all FEMA regions will complete aggressive training for their damage assessment team in hopes that all regions will be up and running with the new technology within one year.

FEMA Data Collection Tool Q&A

Question	Answer
When will this tool be available?	At least a year from now until available. First week of June will be the first pilot class. Then they will do 80 people a week. Training plan very aggressive.
Does FEMA's website have this information available so local EM's can write into new EOP's?	Still a pilot so suggestion is to write plans with FEMA's current system until this is available after the pilot.
Does FEMA have a plan for CBR DA non visible?	FEMA would coordinate with state to do an aerial assessment. If they can't see it they won't assess it. It would be classified as inaccessible and that is it until they can get in. Not included in the dollar amount at that time.
Does FEMA need access to local address database?	The assessors will put street addresses in as well. There will be a place to feed into the real time data base.

Mark Randle – United States Small Business Administration (SBA)

The United States Small Business Administration Office of Disaster Assistance is another resource for damage assessment. The SBA assists private property owners after a disaster with disaster loans. SBA Disaster Loans can be used to repair or replace primary residences and/or personal property and business assets that have been damaged in a disaster. The loan amounts are based on SBA's damage assessment less any other recoveries for the damage received for alternative sources.

The SBA team can be on the ground as soon as twenty-four hours, if needed, to meet with private property owners and conduct damage assessment. If the State requests a preliminary damage assessment (PDA), SBA will join FEMA to conduct damage assessment. Although, it is possible for a State to request SBA assistance without FEMA involvement.

If there is a Presidential Disaster Declaration, SBA's loan program is activated. The SBA administrator declares a disaster if twenty-five homes and/or businesses have sustained uninsured losses of 40% or more. Once an individual applies for assistance, SBA will send out assessors to verify damage (a different assessment from PDA.) SBA loans have a repayment period of thirty years and have an interest of 3-4% based upon individual situations. If an individual chooses, they can use the loan money awarded by SBA to relocate versus rebuild, permitting they meet eligibility requirements.

John Miller-American Red Cross [ARC]

The American Red Cross also utilizes tablets to conduct damage assessment. ARC collaborates with Global Relief Technologies. They have been working with each other for approximately six years. In many cases they cannot conduct a detailed damage assessment for several days due to situations such as safety, the investigation of an area as crime scene status and/or ongoing search and rescue operations.

In comparison to FEMA and SBA, the ARC is less concerned with the dollar values of damage, although ARC's damage assessment terms and definitions align closely with FEMA. ARC is mainly conducting damage assessment to survey sheltering and feeding impacts, as well as mental health and individual assistance needs.

The benefit of using the tablet system for damage assessment is the accuracy and the usability of the downloaded information. Drawbacks include the wireless and cellular capability limits and the ability for real time downloads with the tablet system. The tablet downloads into a spreadsheet format with the latitude and longitude export, mapping output, photo output, and other functions. This information can be shared with Emergency Operation Centers in a much timelier manner than the pencil and paper format of conducting damage assessment.

For additional Mapping Technology examples see [Annex F – Japan Damage Assessment Mapping](#)

Denver UASI & State of Colorado All-Hazards Regional Recovery Framework Review

The *Denver UASI and State of Colorado All-Hazard Regional Recovery Framework* is, as stated, an all-hazards plan, however the CBR annexes and the framework must distinguish the unique damage assessment issues that may exist in the event of a CBR incident. The Damage Assessment KEWG participants reviewed the *Denver UASI and State of Colorado All-Hazard Regional Recovery Framework* within the lens of the WARRP Radiological Device scenario and suggested additions and revisions to the document accordingly. The additions and revisions are as follows:

Table 1 – Framework Issues and Recommendations

Category	Discussion Items	Recommendations
DA Characterization	Language Clarification	It is imperative to recognize at the outset of a CBR incident that damage assessment in this type of situation is drastically different than in a traditional disaster scenario. Damages assessment needs to be redefined as there will likely not be physical feet on the ground looking for damage. The participants suggested the use of alternate terms like “hazard assessment”, “habitability assessment”, and “wide area habitability” to describe damage assessment after a CBR incident.
	Language Clarification	It is important to clarify that damage assessment would be ongoing and repetitive. There would not be just one assessment.
Framework	Support Functions	The Denver UASI and State of Colorado All-Hazards Regional Recovery Framework section regarding infrastructure and property needs to be expanded to include additional organizations within the support function, especially in a CBR incident. Public health (i.e. CDPHE and Denver Health) will play a large role. Other groups that should be included within the support function category are FEMA, private sector businesses, commercial realtors, planning departments and chambers of commerce.
	Addition to Phase 1: Short Term	A component regarding perimeter security, and resources for staffing and/or fencing materials must be included.
		Mission assignments for other federal agencies must be defined.
		The importance of the commercial realtor market to the recovery of an area should be included. The square footage of business space in Denver (or other urban area) needs to be quantified in order to be able to identify alternate space for businesses to relocate in the short-term until recovery is complete. Another consideration is the resiliency of office supply stores and the capacity of such businesses to provide supplies in a disaster area.
		The first consideration should be revised to state, “Developing solutions and implementing plans to incentivize building owners to cleanup in a timely manner so as not to lose tenants should be a priority.”

Category	Discussion Items	Recommendations
		The ninth consideration should be revised to state, “Specialized training to determine the extent of a contamination and determine solutions may be required.”
		<p>The following considerations should be removed, as they are response functions, not recovery functions:</p> <ul style="list-style-type: none"> • Determine backup solutions for critical infrastructure, where possible, to provide the required service (i.e. generators for loss of electricity, potable water for loss of water). • Building owners and businesses will activate their Continuity of Operations (COOP) plan thereby providing redundancies in infrastructure.
Framework	Revision to Phase 1: Short Term	<p>The following considerations should be moved to the intermediate and long-term phases of recovery:</p> <ul style="list-style-type: none"> • Buildings may be demolished, but additional issues regarding the safety of demolition should be assessed and evaluated. • The level of building and property inspection required for certification of re-occupancy should be clarified in advance.
	Addition to Phase 2 and Phase 3: Intermediate and Long-Term	Continuous monitoring systems and devices should be in place and information should be messaged to the public to broadcast achievements and rezoning efforts.
		<p>The zone of contamination will be a moving target. The repopulation zone will likely change by the week based on monitoring and sampling. That information needs to be transmitted to the public to have a continuous repopulation.</p> <p>Discuss with banks and other financial institutions the responsibilities that they have in maintaining abandoned building for future public use.</p>
Framework	Expansion to Phase 2: Intermediate	Consideration number three should be expanded to clarify that legal authorities will not be found in building codes, rather they will be a component of, or developed as part of public health regulations.

Category	Discussion Items	Recommendations
Suggestions/Next Steps	Universal DA Tool	A data collection tool should be established that will allow all agencies to share and/or use one tool or system to collect and utilize DA data for residential and commercial buildings. This tool will have to enable every agency the ability to pick and choose the information for their specific needs. There should be further collaboration to develop DA teams comprised of multiple public and private agencies that accompany one another when doing preliminary DA work in the field.

6.0 Conclusion

Damage assessment is a vital activity for recovery. The rising number of natural disasters, humanitarian emergency situation and threats to the civil society increases the demand for timely and precise information on many different types of scenarios and situations. The rapid and accurate assessment of structural damage is essential after disaster events, especially in densely built-up urban areas. The results provide guidance for rescue efforts and other immediate relief efforts, as well as guidance for subsequent rehabilitation and reconstruction. Damage assessment is a critical first step taken on the path to achieving restoration of human and natural resources affected by a natural or man-made disaster. Damage assessment can be utilized for monitoring damage as recovery shifts from the immediate term, to the intermediate and long term phases of recovery. In a long term recovery, damage assessment can go on for years due to the circumstantial changes affecting the length of the recovery. The bottom line is that damage assessment ends when recovery ends.

Annex A – Agenda

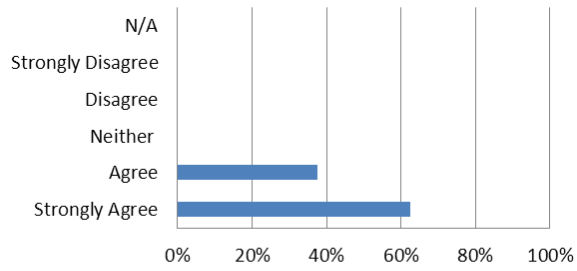
0830 – 0845	Welcome & Introductions
0845 – 0900	Framework Overview & Relationship to Damage Assessment
0900 – 1000	Guest Speaker – Matthew Donley Belfor Property Restoration
1000 – 1015	Break
1015 – 1115	Tools and Technology Demonstration Scott Chamberlain- FEMA Region VIII Mark Randle- Small Business Administration John Miller- American Red Cross
1115 – 1130	Introduce Radiological Scenario
1130 – 1230	Breakout Session I
1230 – 1300	Lunch
1300 – 1330	Report Back from Breakout Session I
1330 – 1430	Breakout Session II
1430 – 1445	Break
1445 – 1515	Report Back from Breakout Session II
1515 – 1530	Recap and Next Steps
1530	Day Ends

Annex B –Participants

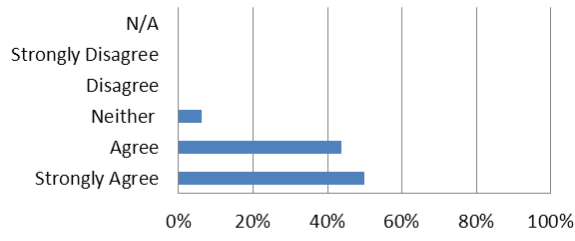
First Name	Last Name	Organization
Garry	Briese	Cubic Applications, Inc.
Scott	Chamberlain	FEMA
John	Darabaris	FEMA
Elizabeth	DiPaolo	Cubic Applications, Inc.
Donley	Mathew	Belfor
Gerald	Eastman	Colorado Springs OEM
Eric	Fried	Larimer County
Elbert	Hunt	Colorado Department of Transportation
Eric	Jacobs	State of Colorado
Laura	Johnston	Dewberry
Carl	Miller	Colorado Springs OEM
John	Miller	American Red Cross
Matthew	Mueller	Denver OEMHS
Phillip	Peterson	CDPHE
Mark	Randle	U.S. Small Business Administration
Michael	Reddoch	Colorado Springs OEM
Kathy	Russell	El Paso County Sheriff's Office - OEM
Fran	Santagata	Douglas County OEM
Michael	Sizemore	City of Denver
LeeAnn	Steinhour	Cubic Applications, Inc.
Jared	Torstenson	CDPHE
Larry	Trumble	CO Chapter Intl Code Council
Teri	Wolfe	Cubic Applications, Inc.

Annex C - Participant Feedback

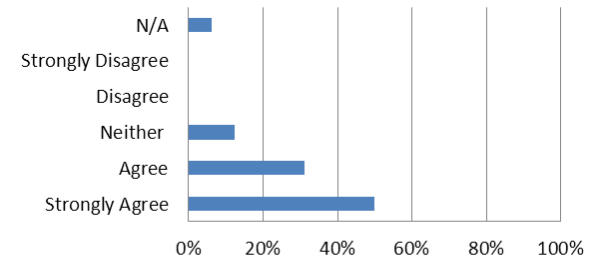
Working Group Was Valuable Use of Time



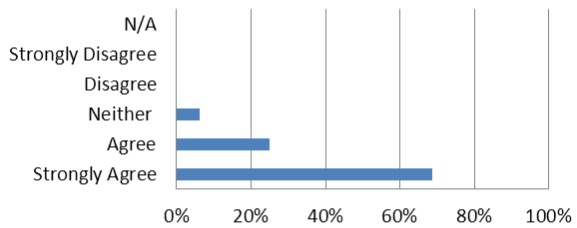
Working Group Expanded Professional Network



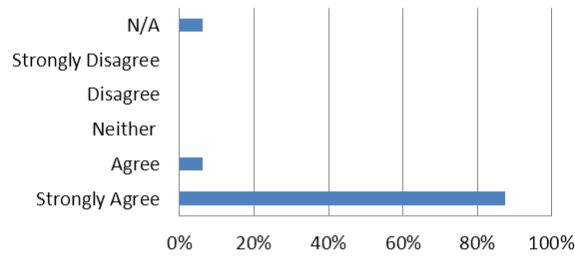
Facilities Contributed to Success



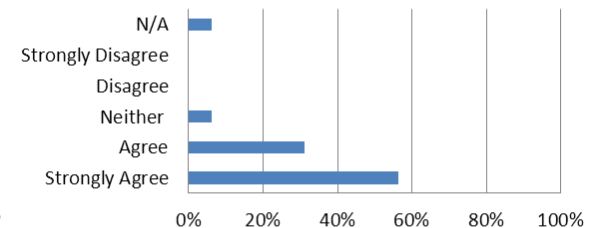
Working Group Increased Awareness of CBR Incident



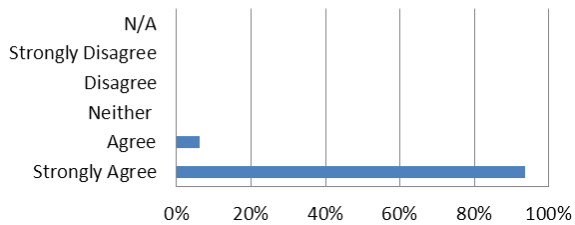
Professional Staff



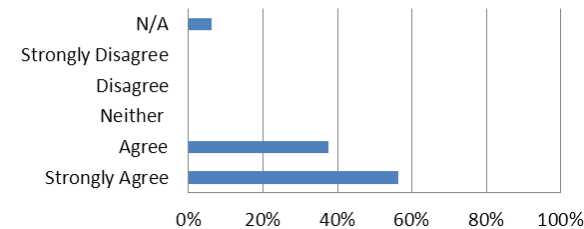
Recommend WARRP Working Groups to Colleagues



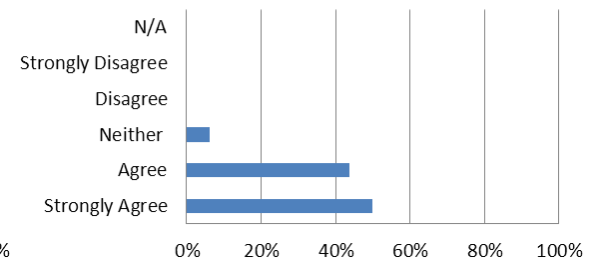
Learned Something New From Working Group



Working Group Identified & Addressed Relevant Issues



Working Group Met Expectations



Annex D – Key Points of Contact

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Small Business Administration

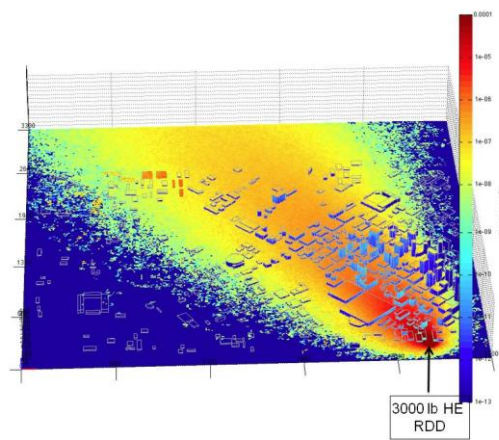
Mark Randle
mark.randle@sba.gov

Annex E – Scenario

RADIOLOGICAL SCENARIO

National Planning Scenario #11: Radiological Attack – Radiological Dispersal Devices

- **Two Radiological Dispersal Device (RDD) attacks at the U.S. Mint (downtown) and the Anschutz Medical Campus (Aurora).** Tens of thousands of people exposed and hundreds of deaths.
- **Evacuations/Displaced Persons** 10,000 evacuated to shelters in safe areas (decontamination required prior to entering shelters) 25,000 in each city are given shelter-in-place instructions. Hundreds of thousands self-evacuate from major urban areas in anticipation of future attacks
- **Most radioactive fallout is within tens of miles**, some may be carried up to hundreds of miles.
 - Hundreds of buildings contaminated
 - Basic services affected
 - Local businesses affected
 - Government operations relocated
 - Mass Transit (East-West rail line) affected
 - Local military installations affected



Radioisotope Background

Cesium-137 (^{137}Cs) is a radioactive isotope of cesium. **The half-life of cesium-137 is 30.17 years.** Because of the chemical nature of cesium, it moves easily through the environment. This makes the cleanup of cesium-137 difficult. People may ingest cesium-137 with food and water, or may inhale it as dust. If cesium-137 enters the body, it is distributed fairly uniformly throughout the body's soft tissues, resulting in exposure of those tissues. Exposure to cesium-137 may also be external (that is, exposure to its gamma radiation from outside the body). If exposures to cesium-137 are very high, serious burns, and even death, can result. People may become internally contaminated (inside their bodies) with radioactive materials by accidentally ingesting (eating or drinking) or inhaling (breathing) them, or through direct contact (open wounds). The sooner these materials are removed from the body, the fewer and less severe the health effects of the contamination will be.

Scenario

Terrorist obtain approximately **2,300 curies of ^{137}Cs (CsCl)**, and 1.5 tons of Ammonium nitrate/Fuel oil (ANFO). The explosive and the shielded CsCl sources are packaged into bombs and loaded onto a truck. The total explosive yield in each device is approximately 3,000 pounds. At 11:15 a.m. during the school year, terrorists detonate the **3,000-pound truck bomb** containing the 2,300 curies of ^{137}Cs outside the U.S. Mint in the downtown business district of Denver. The explosion collapses the front of one building and causes severe damage to three others. Windows are blown out of five other buildings. Amid the destruction, ^{137}Cs contamination covers the scene and the contaminated detonation aerosol is lifted more than 100 feet into the air and spread across a wide area.

In Aurora, a second explosion is timed to go off at approximately 12:30 p.m. on the same day outside The Children's Hospital's Emergency Department, the only Level I Pediatric Trauma Center in Colorado, located in the middle of sprawling Anschutz Medical Campus. The time lag is intended to maximize press coverage and spread fear and uncertainty. Local first-response capacity, however, is depleted in cities two and three because many responder assets have been dispatched to assist nearby Denver during the response.

Annex F - Japan Damage Assessment Mapping

[Miyako](#)

[Kamaishi](#)

[Rikuzentakata](#)

[Kyu Kita Kamigawa](#)

[Torinoumi](#)

[Sendai Airport](#)

[Sendai Airport](#)

[Sendai Sohma Area](#)

[Fukushima Nuclear Power Point](#)

[Fukushima Nuclear Power Plant](#)

Annex G – Acronyms

After Action Report (AAR)
American Red Cross (ARC)
Chemical, Biological, Radiological (CBR)
Centers for Disease Control (CDC)
Colorado Division of Emergency Management (CDEM)
Colorado Department of Public Health (CDPHE)
Colorado Emergency Preparedness Partnership (CEPP)
Damage Assessment (DA)
Department of Homeland Security (DHS)
Department of Defense (DoD)
Department of Energy (DOE)
Defense Threat Reduction Agency (DTRA)
Emergency Management (EM)
Frequently Asked Question (FAQ)
Federal Emergency Management Agency (FEMA)
Health and Human Services (HHS)
Individual Assistance (IA)
International Code Council (ICC)
Interagency Biological Restoration Demonstration (IBRD)
Lawrence Livermore National Laboratories (LLNL)
Multi-Agency Coordination (MAC)
National Disaster Recovery Framework (NDRF)
Office of Emergency Management (OEM)
Preliminary Damage Assessment (PDA)
Public Assistance (PA)
Pacific Northwest National Laboratory (PNNL)
Point of Contact (POC)
Recovery Support Function (RSF)
Social Media (SM)
Small Business Administration (SBA)
Subject Matter Expert (SME)
Sandia National Laboratory (SNL)
Science and Technology (S&T)
Urban Area Security Initiative (UASI)
Voluntary Organizations Active in Disaster (VOAD)
Wide Area Recovery & Resiliency Program (WARRP)